



**BRUHATH BANGALORE MAHANAGARA PALIKE**  
**Byatarayanapura Division**

**Name of the work: Improvements to Roads and drains at Hoodi  
Layout , Talacauvery Layout And surrounding Areas in ward No 07  
- Byatarayanapura, Kodigehalli Sub Division.**

**Second RA Bill  
Test Reports**

| Project                                              | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                                 |            |        |        |                |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------|--------|--------|----------------|
| Client                                               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                                 |            |        |        |                |
| Consultant                                           | M/s Tejus Consultants                                                                                                                                  |                                 |            |        |        |                |
| Contractor                                           | M/S Ram and Company, Engineers & Contractors.                                                                                                          |                                 |            |        |        |                |
| <b>AGGREGATE IMPACT VALUE</b><br>(IS: 2386 Part - 4) |                                                                                                                                                        |                                 |            |        |        |                |
| Proposed Use                                         | WMM                                                                                                                                                    | Date of Sampling                | 01/02/2018 |        |        |                |
| Sample Location                                      | At plant                                                                                                                                               | Date of Testing                 | 01/02/2018 |        |        |                |
|                                                      |                                                                                                                                                        |                                 |            |        |        |                |
| Sl. No.                                              | Description                                                                                                                                            |                                 | Test No.   |        |        | Spec Limit (%) |
|                                                      |                                                                                                                                                        |                                 | 1          | 2      | 3      |                |
| 1                                                    | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)                                                                   | (Wa)                            | 350.00     | 385.00 | 400.00 |                |
| 2                                                    | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)                                                                             | (Wb)                            | 278.00     | 302.00 | 310.00 |                |
| 3                                                    | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)                                                                               | (Wc)                            | 72.00      | 83.00  | 90.00  |                |
| 4                                                    | Aggregate Impact Value (%)                                                                                                                             | (Wc/Wa)*<br>100                 | 20.57      | 21.56  | 22.50  |                |
| 5                                                    | Average Aggregate impact value                                                                                                                         | (%)                             | 21.54      |        |        | Max - 30 %     |
| Remarks :                                            |                                                                                                                                                        | Satisfactory / Not Satisfactory |            |        |        |                |

*ASWT*  
*P*  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*M. H. N. D.*  
*AE (17)*

Consultant's Representative

*K. P. H. S.*

FORMAL COMPANY

*[Signature]*

|            |                                                                                                                                                        |  |  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Project    | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |  |  |
| Client     | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |  |  |
| Consultant | M/s Tejus Consultants                                                                                                                                  |  |  |
| Contractor | M/S Ram and Company, Engineers & Contractors.                                                                                                          |  |  |

**FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)**

|                  |          |                  |            |
|------------------|----------|------------------|------------|
| Type of Material | WMM      | Proposed Use     | WMM        |
| Sample Location  | At plant | Date of Sampling | 01/02/2018 |
|                  |          | Date of Testing  | 01/02/2018 |

| Size of aggregate            |                          | Flakiness Index                                    |                                                       | Elongation Index                                     |                                                                                         |
|------------------------------|--------------------------|----------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge (D) gms |
| 63.0                         | 50.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                       |
| 50.0                         | 40.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                       |
| 40.0                         | 31.5                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                       |
| 31.5                         | 25.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                       |
| 25.0                         | 20.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                       |
| 20.0                         | 16.0                     | 850                                                | 62                                                    | 788                                                  | 85                                                                                      |
| 16.0                         | 12.5                     | 1200                                               | 116                                                   | 1084                                                 | 132                                                                                     |
| 12.5                         | 10.0                     | 800                                                | 80                                                    | 720                                                  | 62                                                                                      |
| 10.0                         | 6.3                      | 500                                                | 74                                                    | 426                                                  | 44                                                                                      |
| <b>Total</b>                 |                          | <b>3350</b>                                        | <b>332</b>                                            | <b>3018</b>                                          | <b>323</b>                                                                              |

Note: Minimum 200 Pcs should be taken on each fraction of test

|                      |       |
|----------------------|-------|
| Flakiness Index(%):  | 9.91  |
| Elongation Index(%): | 10.70 |
| Combined FI+EL (%)   | 20.61 |

*Handwritten:* Ag 157  
*Stamp:* Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*Handwritten:* M. L. N. D  
*Stamp:* For M/s. RAMA COMPANY  
*Signature:* [Signature]

*Stamp:* TEJUS CONSULTANTS  
*Signature:* [Signature]  
Consultant's Representative

|                 |   |                                                                                                                                                        |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                  |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors.                                                                                                          |
| Date of Testing | : | 01/02/2018                                                                                                                                             |
| Type of Mix     | : | WMM                                                                                                                                                    |
| Sample I/D      | : | WMM 1                                                                                                                                                  |

GRADATION FOR WMM  
(As per MORT&H 400-11)

|                             |          |                    |            |
|-----------------------------|----------|--------------------|------------|
| Sample Location:            | At plant | Date of Sampling:  | 01/02/2018 |
|                             |          | Date of testing:   | 01/02/2018 |
| Type of material & Purpose: | WMM      | Oven Dry Wt.(gms): | 10000.0    |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---------------------|-----------------|----------------------------------|---------------------------|--------------------------|----------------------|
| 53                  | 0               | 0                                | 0.00                      | 100.00                   | 100.00               |
| 45                  | 578             | 578                              | 5.78                      | 94.22                    | 95-100               |
| 22.4                | 2120            | 2698                             | 26.98                     | 73.02                    | 60-80                |
| 11.2                | 1628            | 4326                             | 43.26                     | 56.74                    | 40-60                |
| 4.75                | 1862.0          | 6188                             | 61.88                     | 38.12                    | 25-40                |
| 2.36                | 1235.0          | 7423                             | 74.23                     | 25.77                    | 15-30                |
| 0.6                 | 982.0           | 8405                             | 84.05                     | 15.95                    | 8.0-22.0             |
| 0.075               | 962.0           | 9367                             | 93.67                     | 6.33                     | 0-8                  |
| Pan                 | 633.0           |                                  |                           |                          |                      |
| Total               | 10000.0         |                                  |                           |                          |                      |

As per  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

M. K. U. N. D.  
A.E. (W&D)

Consultant's Representative  
X. P. 1102

For M/s. RAM & COMPANY  
Ram & Co.

|                                                                                                   |                                                                                                                                                        |            |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Project                                                                                           | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |            |
| Client                                                                                            | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |            |
| Consultant                                                                                        | M/s Tejus Consultants                                                                                                                                  |            |
| Contractor                                                                                        | M/S Ram and Company, Engineers & Contractors.                                                                                                          |            |
| Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28))                      |                                                                                                                                                        |            |
|                                                                                                   | Date:                                                                                                                                                  | 03/02/2018 |
|                                                                                                   |                                                                                                                                                        |            |
| Layer no. or level                                                                                | WMM I layer                                                                                                                                            |            |
| Depth of hole                                                                                     | 250mm                                                                                                                                                  |            |
|                                                                                                   |                                                                                                                                                        |            |
| Field density:                                                                                    | 1                                                                                                                                                      | 2          |
| Wt. of wet material from hole (Ww) gms.                                                           | 6020                                                                                                                                                   | 6032       |
| Wt. of sand+cylinder before pouring (w1) gms.                                                     | 14000                                                                                                                                                  | 14000      |
| Wt. of sand+cylinder after pouring (w2) gms.                                                      | 9593                                                                                                                                                   | 9582       |
| Wt. of sand in cone (w3) gms.                                                                     | 835                                                                                                                                                    | 842        |
| Wt. of sand in hole (w4)=(w1-w2-w3) gms.                                                          | 3572                                                                                                                                                   | 3576       |
| Bulk density of sand ( $\gamma_s$ )gm/cc                                                          | 1.31                                                                                                                                                   | 1.31       |
| Bulk density of material(i.e. wt. of the wet material) ( $\gamma_b$ )=(Ww/w4*( $\gamma_s$ ))gm/cc | 2.21                                                                                                                                                   | 2.21       |
|                                                                                                   |                                                                                                                                                        |            |
| Moisture meter reading(moisture content)                                                          | 12.00                                                                                                                                                  | 11.96      |
|                                                                                                   |                                                                                                                                                        |            |
| Result                                                                                            |                                                                                                                                                        |            |
| FDD(Wt.of the dry material)=(100 $\gamma_b$ /100+mc)gm/cc                                         | 1.97                                                                                                                                                   | 1.97       |
| MDD                                                                                               | 2.00                                                                                                                                                   | 2.00       |
| OMC                                                                                               | 12.00%                                                                                                                                                 | 12.00%     |
| % compaction obtained                                                                             | 98.56                                                                                                                                                  | 98.68      |
| % compaction required                                                                             | 98%                                                                                                                                                    | 98%        |

AS 107  
Assistant Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

M. P. U. N. D  
A E (127)

TEJUS CONSULTANT  
Consultant's Representative

For M/s. RAM & COMPANY

Partner

|            |                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project    | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client     | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant | M/s Tejus Consultants                                                                                                                                  |
| Contractor | M/S Ram and Company, Engineers & Contractors.                                                                                                          |

**AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)**

|                 |          |                  |            |
|-----------------|----------|------------------|------------|
| Proposed Use    | DBM      | Date of Sampling | 14/02/2018 |
| Sample Location | At plant | Date of Testing  | 14/02/2018 |

| Sl. No. | Description                                                                          |             | Test No. |        |        | Spec Limit (%) |
|---------|--------------------------------------------------------------------------------------|-------------|----------|--------|--------|----------------|
|         |                                                                                      |             | 1        | 2      | 3      |                |
| 1       | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa)        | 375.00   | 365.00 | 380.00 |                |
| 2       | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)           | (Wb)        | 292.00   | 282.00 | 293.00 |                |
| 3       | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)             | (Wc)        | 83.00    | 83.00  | 87.00  |                |
| 4       | Aggregate Impact Value (%)                                                           | (Wc/Wa)*100 | 22.13    | 22.74  | 22.89  |                |
| 5       | Average Aggregate impact value                                                       | (%)         | 22.59    |        |        | Max - 30 %     |

Remarks : Satisfactory / Not Satisfactory

*Handwritten:* Agg. WT  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*Handwritten:* 10/4/18 N.D  
AEL (174)

Consultant's Representative

*Handwritten Signature:* X. J. R.

For M/s. RAM & COMPANY  
*Handwritten Signature:* [Signature]  
Partner

|                                                           |                                                                                                                                                       |                                                    |                                                       |                                                      |                                                                                       |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|
| Project                                                   | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byataayanapura, Kodigehalli Sub Division. |                                                    |                                                       |                                                      |                                                                                       |
| Client                                                    | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                    |                                                    |                                                       |                                                      |                                                                                       |
| Consultant                                                | M/s Tejus Consultants                                                                                                                                 |                                                    |                                                       |                                                      |                                                                                       |
| Contractor                                                | M/S Ram and Company, Engineers & Contractors                                                                                                          |                                                    |                                                       |                                                      |                                                                                       |
| <b>FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)</b> |                                                                                                                                                       |                                                    |                                                       |                                                      |                                                                                       |
| Type of Material                                          | DBM                                                                                                                                                   |                                                    | Proposed Use                                          | DBM                                                  |                                                                                       |
| Sample Location                                           | At plant                                                                                                                                              |                                                    | Date of Sampling                                      | 14/02/2018                                           |                                                                                       |
|                                                           |                                                                                                                                                       |                                                    | Date of Testing                                       | 14/02/2018                                           |                                                                                       |
| Size of aggregate                                         | Flakiness Index                                                                                                                                       |                                                    | Elongation Index                                      |                                                      |                                                                                       |
| Passing through IS sieve, mm                              | Retained on IS sieve, mm                                                                                                                              | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0                                                      | 50.0                                                                                                                                                  | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 50.0                                                      | 40.0                                                                                                                                                  | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 40.0                                                      | 31.5                                                                                                                                                  | 7850                                               | 698                                                   | 7152                                                 | 402                                                                                   |
| 31.5                                                      | 25.0                                                                                                                                                  | 4200                                               | 188                                                   | 3569                                                 | 200                                                                                   |
| 25.0                                                      | 20.0                                                                                                                                                  | 2350                                               | 296                                                   | 1978                                                 | 232                                                                                   |
| 20.0                                                      | 16.0                                                                                                                                                  | 1250                                               | 344                                                   | 1000                                                 | 268                                                                                   |
| 16.0                                                      | 12.5                                                                                                                                                  | 500                                                | 110                                                   | 390                                                  | 102                                                                                   |
| 12.5                                                      | 10.0                                                                                                                                                  | 300                                                | 80                                                    | 230                                                  | 96                                                                                    |
| 10.0                                                      | 6.3                                                                                                                                                   | 100                                                | 82                                                    | 80                                                   | 88                                                                                    |
| <b>Total</b>                                              |                                                                                                                                                       | <b>16550</b>                                       | <b>1798</b>                                           | <b>14399</b>                                         | <b>1388</b>                                                                           |
| <b>Results</b>                                            |                                                                                                                                                       |                                                    |                                                       |                                                      |                                                                                       |
|                                                           |                                                                                                                                                       | Flakiness Index(%):                                | 10.86                                                 |                                                      |                                                                                       |
|                                                           |                                                                                                                                                       | Elongation Index(%):                               | 9.64                                                  |                                                      |                                                                                       |
|                                                           |                                                                                                                                                       | Combined FI+EL (%)                                 | 20.50                                                 |                                                      |                                                                                       |

*AE WJ*  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*M. L. U. N. D.*  
*AE (WJ)*

Consultant's Representative

*X. L. U. R.*

For M/s. P. R. COMPANY  
*[Signature]*

|                                                              |                 |                                                                                                                                                        |                           |                          |                      |
|--------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| Name of Work                                                 | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
| Client                                                       | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                                   | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                                   | :               | M/S Ram and Company, Engineers & Contractors.                                                                                                          |                           |                          |                      |
| Date of Testing                                              | :               | 14/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                                  | :               | DBM                                                                                                                                                    |                           |                          |                      |
| Sample I/D                                                   | :               | DBM-1                                                                                                                                                  |                           |                          |                      |
| <b>GRADATION FOR DBM</b><br>(As per MORT&H 500-10,Grading-2) |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                                             | At plant        | Date of Sampling:                                                                                                                                      | 14/02/2018                |                          |                      |
|                                                              |                 | Date of testing:                                                                                                                                       | 14/02/2018                |                          |                      |
| Type of material & Purpose:                                  | DBM             | Oven Dry Wt.(gms):                                                                                                                                     | 1500.0                    |                          |                      |
| IS Sieve size in mm                                          | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 37.50                                                        | 0               | 0                                                                                                                                                      | 0.00                      | 100.00                   | 100.00               |
| 26.50                                                        | 100             | 100                                                                                                                                                    | 6.67                      | 93.33                    | 90-100               |
| 19.00                                                        | 122             | 222                                                                                                                                                    | 14.80                     | 85.20                    | 71-95                |
| 13.20                                                        | 262             | 484                                                                                                                                                    | 32.27                     | 67.73                    | 56-80                |
| 4.750                                                        | 366             | 850                                                                                                                                                    | 56.67                     | 43.33                    | 38-54                |
| 2.360                                                        | 182             | 1032                                                                                                                                                   | 68.80                     | 31.20                    | 28-42                |
| 0.300                                                        | 244             | 1276                                                                                                                                                   | 85.07                     | 14.93                    | 7-21                 |
| 0.075                                                        | 150             | 1426                                                                                                                                                   | 95.07                     | 4.93                     | 2-8                  |
| Pan                                                          | 74              |                                                                                                                                                        |                           |                          |                      |
| Total                                                        | 1500.0          |                                                                                                                                                        |                           |                          |                      |

Assistant Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

For M/s. RAM & COMPANY

Consultant's Representative

| BITUMEN CONTENT AND GRADATION DETERMINATION OF |                 |                                                                                                                                                        |                           |                          |                      |
|------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| DENSE BITUMINOUS MACADAM MIX                   |                 |                                                                                                                                                        |                           |                          |                      |
| Name of Work                                   | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
| Client                                         | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                     | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                     | :               | M/S Ram and Company, Engineers & Contractors.                                                                                                          |                           |                          |                      |
| Date of Testing                                | :               | 16/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                    | :               | DBM                                                                                                                                                    |                           |                          |                      |
| Sample I/D                                     | :               | DBM-1                                                                                                                                                  |                           |                          |                      |
|                                                |                 |                                                                                                                                                        |                           |                          |                      |
| DETERMINATION OF BITUMEN CONTENT               |                 |                                                                                                                                                        |                           |                          |                      |
| Description                                    |                 | Trail 1                                                                                                                                                | Trail 2                   |                          |                      |
| 1. Weight of Mixture before extraction, g      |                 | 850                                                                                                                                                    | 950                       |                          |                      |
| 2. Weight of Mixture after extraction, g       |                 | 813                                                                                                                                                    | 909                       |                          |                      |
| 3. Weight of Bitumen                           |                 | 37                                                                                                                                                     | 41                        |                          |                      |
| 4. Weight of filter paper before extraction, g |                 | 2.30                                                                                                                                                   | 2.00                      |                          |                      |
| 5. Weight of filter paper after extraction, g  |                 | 3.60                                                                                                                                                   | 3.80                      |                          |                      |
| 6. Weight of fines, g                          |                 | 1.30                                                                                                                                                   | 1.80                      |                          |                      |
| 7. Weight of Bitumen & fines                   |                 | 38.30                                                                                                                                                  | 42.80                     |                          |                      |
| 8. Bitumen content in %                        |                 | 4.51                                                                                                                                                   | 4.51                      |                          |                      |
| 9. Average Bitumen content in %                |                 | 4.51                                                                                                                                                   |                           |                          |                      |
| 10. Minimum Bitumen content in %               |                 | 4.50                                                                                                                                                   |                           |                          |                      |
| GRADATION FOR DBM AFTER EXTRACTION             |                 |                                                                                                                                                        |                           |                          |                      |
| (As per MORT&H 500-10,Grading-2)               |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                               | At site         | Date of Sampling:                                                                                                                                      | 16/02/2018                |                          |                      |
|                                                |                 | Date of testing:                                                                                                                                       | 16/02/2018                |                          |                      |
| Type of material & Purpose:                    | DBM             | Oven Dry Wt.(gms):                                                                                                                                     | 813                       |                          |                      |
| IS Sieve size in mm                            | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 37.50                                          | 0.0             | 0.0                                                                                                                                                    | 0.00                      | 100.00                   | 100.00               |
| 26.50                                          | 52.0            | 52.0                                                                                                                                                   | 6.40                      | 93.60                    | 90-100               |
| 19.00                                          | 126.0           | 178.0                                                                                                                                                  | 21.89                     | 78.11                    | 71-95                |
| 13.20                                          | 100.0           | 278.0                                                                                                                                                  | 34.19                     | 65.81                    | 56-80                |
| 4.750                                          | 128.0           | 406.0                                                                                                                                                  | 49.94                     | 50.06                    | 38-54                |
| 2.360                                          | 122.0           | 528.0                                                                                                                                                  | 64.94                     | 35.06                    | 28-42                |
| 0.300                                          | 132.0           | 660.0                                                                                                                                                  | 81.18                     | 18.82                    | 7-21                 |
| 0.075                                          | 95.0            | 755.0                                                                                                                                                  | 92.87                     | 7.13                     | 2-8                  |
| Pan                                            | 58.0            |                                                                                                                                                        |                           |                          |                      |
| Total                                          | 813.0           |                                                                                                                                                        |                           |                          |                      |

*AF 127*  
*R*  
Assistant Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*M. H. NAD*  
*AF(127)*

*K. S. S. R.*  
Consultant's Representative

|                 |   |                                                                                                                                                              |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout ,<br>Talacauvery Layout And surrounding Areas in ward No 07 -<br>Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                           |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                        |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors                                                                                                                 |
| Date of Testing | : | 16/02/2018                                                                                                                                                   |
| Type of Mix     | : | Tack coat                                                                                                                                                    |
| Sample I/D      | : | 1                                                                                                                                                            |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| Determination                                               | Unit    | Test No       |            |
|-------------------------------------------------------------|---------|---------------|------------|
|                                                             |         | 1             | 2          |
| Size of Plate (mxm)                                         | Mt      | 0.30 x .30    | 0.30 x .30 |
| Area of Plate (a)                                           | Sq.mtr  | 0.09          | 0.09       |
| Initial Wt of empty Plate (b)                               | Kg      | 0.762         | 0.738      |
| Final weight of plate after<br>application of tack Coat (c) | Kg      | 0.785         | 0.761      |
| Weight of tack Coat (d=c-b)                                 | Kg      | 0.023         | 0.023      |
| Rate of spread of tack coat                                 | Kg/sq.m | 0.256         | 0.256      |
| Average                                                     | Kg/sq.m | 0.256         |            |
| Specified Limit                                             | Kg/sq.m | 0.250 Kg/sq.m |            |

*Agw*  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

*M. L. P. N. D.*  
*AE (W)*

TEJUS CONSULTANTS  
Consultant's Representative  
*[Signature]*

For M/S. RAM AND COMPANY  
*[Signature]*  
Partner

|                 |   |                                                                                                                                                        |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                  |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors                                                                                                           |
| Date of Testing | : | 16/02/2018                                                                                                                                             |
| Type of Mix     | : | Tack coat DBM                                                                                                                                          |
| Sample I/D      | : | 2                                                                                                                                                      |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| Determination                                            | Unit    | Test No       |            |
|----------------------------------------------------------|---------|---------------|------------|
|                                                          |         | 1             | 2          |
| Size of Plate (mxm)                                      | Mt      | 0.30 x .30    | 0.30 x .30 |
| Area of Plate (a)                                        | Sq.mtr  | 0.09          | 0.09       |
| Initial Wt of empty Plate (b)                            | Kg      | 0.771         | 0.753      |
| Final weight of plate after application of tack Coat (c) | Kg      | 0.794         | 0.776      |
| Weight of tack coat (d=c-b)                              | Kg      | 0.023         | 0.023      |
| Rate of spread of tack coat                              | Kg/sq.m | 0.256         | 0.256      |
| Average                                                  | Kg/sq.m | 0.256         |            |
| Specified Limit                                          | Kg/sq.m | 0.250 Kg/sq.m |            |

*A-27*  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

For M/s Ram and Company

*[Signature]*  
Partner

*M. L. N. D.*  
*AE (2)*





TEJUS

|                                            |                                                                                                                                                        |                                 |            |        |                |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------|--------|----------------|
| Project                                    | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                                 |            |        |                |
| Client                                     | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                                 |            |        |                |
| Consultant                                 | M/s Tejus Consultants                                                                                                                                  |                                 |            |        |                |
| Contractor                                 | M/S Ram and Company, Engineers & Contractors                                                                                                           |                                 |            |        |                |
| AGGREGATE IMPACT VALUE (IS: 2386 Part - 4) |                                                                                                                                                        |                                 |            |        |                |
| Proposed Use                               | BC                                                                                                                                                     | Date of Sampling                | 17/02/2018 |        |                |
| Sample Location                            | At plant                                                                                                                                               | Date of Testing                 | 17/02/2018 |        |                |
| Sl. No.                                    | Description                                                                                                                                            | Test No.                        |            |        | Spec Limit (%) |
|                                            |                                                                                                                                                        | 1                               | 2          | 3      |                |
| 1                                          | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) (Wa)                                                              | 360.00                          | 375.00     | 385.00 |                |
| 2                                          | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) (Wb)                                                                        | 282.00                          | 292.00     | 306.00 |                |
| 3                                          | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) (Wc)                                                                          | 78.00                           | 83.00      | 79.00  |                |
| 4                                          | Aggregate Impact Value (%) (Wc/Wa)*100                                                                                                                 | 21.67                           | 22.13      | 20.52  |                |
| 5                                          | Average Aggregate impact value (%)                                                                                                                     | 21.44                           |            |        | Max - 30 %     |
| Remarks :                                  |                                                                                                                                                        | Satisfactory / Not Satisfactory |            |        |                |

AG WT  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

M. L. P. N. D  
AE (WT)

Consultant's Representative



For M/s Ram and Company

Partner

|            |                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project    | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client     | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant | M/s Tejus Consultants                                                                                                                                  |
| Contractor | M/S Ram and Company, Engineers & Contractors                                                                                                           |

**FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)**

|                  |          |                  |            |
|------------------|----------|------------------|------------|
| Type of Material | BC       | Proposed Use     | BC         |
| Sample Location  | At plant | Date of Sampling | 17/02/2018 |
|                  |          | Date of Testing  | 17/02/2018 |

| Size of aggregate            |                          | Flakiness Index                                    |                                                       | Elongation Index                                     |                                                                                       |
|------------------------------|--------------------------|----------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0                         | 50.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 50.0                         | 40.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 40.0                         | 31.5                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 31.5                         | 25.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 25.0                         | 20.0                     | 0                                                  | 0                                                     | 0                                                    | 0                                                                                     |
| 20.0                         | 16.0                     | 950                                                | 102                                                   | 848                                                  | 82                                                                                    |
| 16.0                         | 12.5                     | 1360                                               | 96                                                    | 1264                                                 | 106                                                                                   |
| 12.5                         | 10.0                     | 650                                                | 72                                                    | 578                                                  | 72                                                                                    |
| 10.0                         | 6.3                      | 550                                                | 62                                                    | 488                                                  | 46                                                                                    |
| <b>Total</b>                 |                          | <b>3510</b>                                        | <b>332</b>                                            | <b>3178</b>                                          | <b>306</b>                                                                            |

Note: Minimum 200 Pcs should be taken on each fraction of test

|                     |       |
|---------------------|-------|
| Flakiness Index(%)  | 9.46  |
| Elongation Index(%) | 9.63  |
| Combined FI+EL (%)  | 19.09 |

Asst. Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

M. H. N. D.  
A.E. (W.A.)



For M/s. RAM & COMPANY  
[Signature]

| Name of Work                                                 | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
|--------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| Client                                                       | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                                   | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                                   | :               | M/S Ram and Company, Engineers & Contractors                                                                                                           |                           |                          |                      |
| Date of Testing                                              | :               | 17/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                                  | :               | BC                                                                                                                                                     |                           |                          |                      |
| Sample I/D                                                   | :               | BC1                                                                                                                                                    |                           |                          |                      |
| <b>GRADATION FOR BC</b><br>(As per MORT&H 500-18, Grading-2) |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                                             | At plant        | Date of Sampling:                                                                                                                                      | 17/02/2018                |                          |                      |
|                                                              |                 | Date of testing:                                                                                                                                       | 17/02/2018                |                          |                      |
| Type of material & Purpose:                                  | BC              | Oven Dry Wt.(gms):                                                                                                                                     | 1200.0                    |                          |                      |
| IS Sieve size in mm                                          | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 19.00                                                        | 0               | 0                                                                                                                                                      | 0.00                      | 100.00                   | 100.00               |
| 13.20                                                        | 98              | 98.0                                                                                                                                                   | 8.17                      | 91.83                    | 79 - 100             |
| 9.50                                                         | 96              | 194.0                                                                                                                                                  | 16.17                     | 83.83                    | 71 - 95              |
| 4.75                                                         | 242             | 436.0                                                                                                                                                  | 36.33                     | 63.67                    | 53 - 71              |
| 2.360                                                        | 128             | 564.0                                                                                                                                                  | 47.00                     | 53.00                    | 42 - 58              |
| 1.180                                                        | 102             | 666.0                                                                                                                                                  | 55.50                     | 44.50                    | 34 - 48              |
| 0.600                                                        | 100             | 766.0                                                                                                                                                  | 63.83                     | 36.17                    | 26 - 38              |
| 0.300                                                        | 126             | 892.0                                                                                                                                                  | 74.33                     | 25.67                    | 18 - 28              |
| 0.150                                                        | 102             | 994.0                                                                                                                                                  | 82.83                     | 17.17                    | 12 - 20              |
| 0.075                                                        | 114             | 1108.0                                                                                                                                                 | 92.33                     | 7.67                     | 4 - 10               |
| Pan                                                          | 92.0            |                                                                                                                                                        |                           |                          |                      |
| Total                                                        | 1200.0          |                                                                                                                                                        |                           |                          |                      |

*AE (LST)*  
Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

For M/s. RAMS COMPANY

Partner

*M. H. N. D.*  
AE (LST)

Consultant's Representative

*K. P. S. S.*

|                 |   |                                                                                                                                                        |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                  |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors                                                                                                           |
| Date of Testing | : | 17/02/2018                                                                                                                                             |
| Type of Mix     | : | BC                                                                                                                                                     |
| Sample I/D      | : | BC1                                                                                                                                                    |

**GRADATION FOR BC**  
(As per MORT&H 500-18,Grading-2)

|                             |          |                    |            |
|-----------------------------|----------|--------------------|------------|
| Sample Location:            | At plant | Date of Sampling:  | 17/02/2018 |
|                             |          | Date of testing:   | 17/02/2018 |
| Type of material & Purpose: | BC       | Oven Dry Wt.(gms): | 1200.0     |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---------------------|-----------------|----------------------------------|---------------------------|--------------------------|----------------------|
| 19.00               | 0               | 0                                | 0.00                      | 100.00                   | 100.00               |
| 13.20               | 102             | 102.0                            | 8.50                      | 91.50                    | 79 - 100             |
| 9.50                | 112             | 214.0                            | 17.83                     | 82.17                    | 71 - 95              |
| 4.75                | 236             | 450.0                            | 37.50                     | 62.50                    | 53 - 71              |
| 2.360               | 182             | 632.0                            | 52.67                     | 47.33                    | 42 - 58              |
| 1.180               | 116             | 748.0                            | 62.33                     | 37.67                    | 34 - 48              |
| 0.600               | 100             | 848.0                            | 70.67                     | 29.33                    | 26 - 38              |
| 0.300               | 122             | 970.0                            | 80.83                     | 19.17                    | 18 - 28              |
| 0.150               | 66              | 1036.0                           | 86.33                     | 13.67                    | 12 - 20              |
| 0.075               | 102             | 1138.0                           | 94.83                     | 5.17                     | 4 - 10               |
| Pan                 | 62.0            |                                  |                           |                          |                      |
| Total               | 1200.0          |                                  |                           |                          |                      |

*Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Taluk, B.B.M.P.,  
Bangalore.*

*For M/s. RAM & COMPANY*

*M. H. N. D.  
AE (W)*

Consultant's Representative



|                 |   |                                                                                                                                                        |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                  |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors                                                                                                           |
| Date of Testing | : | 17/02/2018                                                                                                                                             |
| Type of Mix     | : | BC                                                                                                                                                     |
| Sample I/D      | : | BC1                                                                                                                                                    |

**GRADATION FOR BC**  
(As per MORT&H 500-18,Grading-2)

|                             |          |                    |            |
|-----------------------------|----------|--------------------|------------|
| Sample Location:            | At plant | Date of Sampling:  | 17/02/2018 |
|                             |          | Date of testing:   | 17/02/2018 |
| Type of material & Purpose: | BC       | Oven Dry Wt.(gms): | 1200.0     |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---------------------|-----------------|----------------------------------|---------------------------|--------------------------|----------------------|
| 19.00               | 0               | 0                                | 0.00                      | 100.00                   | 100.00               |
| 13.20               | 96              | 96.0                             | 8.00                      | 92.00                    | 79 - 100             |
| 9.50                | 112             | 208.0                            | 17.33                     | 82.67                    | 71 - 95              |
| 4.75                | 240             | 448.0                            | 37.33                     | 62.67                    | 53 - 71              |
| 2.360               | 132             | 580.0                            | 48.33                     | 51.67                    | 42 - 58              |
| 1.180               | 112             | 692.0                            | 57.67                     | 42.33                    | 34 - 48              |
| 0.600               | 100             | 792.0                            | 66.00                     | 34.00                    | 26 - 38              |
| 0.300               | 116             | 908.0                            | 75.67                     | 24.33                    | 18 - 28              |
| 0.150               | 98              | 1006.0                           | 83.83                     | 16.17                    | 12 - 20              |
| 0.075               | 96              | 1102.0                           | 91.83                     | 8.17                     | 4 - 10               |
| Pan                 | 98.0            |                                  |                           |                          |                      |
| Total               | 1200.0          |                                  |                           |                          |                      |

Asst. Executive Engineer  
Kodigehalli Sub Division,  
Yelahanka 2nd Stage,  
Bangalore.

For M/S RAM & COMPANY  
Partner

M. H. N. D  
AE (W)

TEJUS CONSULTANTS  
Consultant's Representative

| BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX |                 |                                                                                                                                                        |                           |                          |                      |
|------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| Name of Work                                                           | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
| Client                                                                 | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                                             | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                                             | :               | M/S Ram and Company, Engineers & Contractors                                                                                                           |                           |                          |                      |
| Date of Testing                                                        | :               | 19/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                                            | :               | BC                                                                                                                                                     |                           |                          |                      |
| Sample I/D                                                             | :               | BC1                                                                                                                                                    |                           |                          |                      |
| DETERMINATION OF BITUMEN CONTENT                                       |                 |                                                                                                                                                        |                           |                          |                      |
| Description                                                            | Trail 1         | Trail 2                                                                                                                                                |                           |                          |                      |
| 1. Weight of Mixture before extraction, g                              | 930             | 875                                                                                                                                                    |                           |                          |                      |
| 2. Weight of Mixture after extraction, g                               | 878             | 826                                                                                                                                                    |                           |                          |                      |
| 3. Weight of Bitumen                                                   | 52              | 49                                                                                                                                                     |                           |                          |                      |
| 4. Weight of filter paper before extraction, g                         | 2.00            | 2.00                                                                                                                                                   |                           |                          |                      |
| 5. Weight of filter paper after extraction, g                          | 4.00            | 3.80                                                                                                                                                   |                           |                          |                      |
| 6. Weight of fines, g                                                  | 2.00            | 1.80                                                                                                                                                   |                           |                          |                      |
| 7. Weight of Bitumen & fines                                           | 54.00           | 50.80                                                                                                                                                  |                           |                          |                      |
| 8. Bitumen content in %                                                | 5.81            | 5.81                                                                                                                                                   |                           |                          |                      |
| 9. Average Bitumen content in %                                        | 5.81            |                                                                                                                                                        |                           |                          |                      |
| 10. Minimum Bitumen content in %                                       | 5.80            |                                                                                                                                                        |                           |                          |                      |
| GRADATION FOR BC AFTER EXTRACTION                                      |                 |                                                                                                                                                        |                           |                          |                      |
| (As per MORT&H 500-18, Grading-2)                                      |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                                                       | At site         | Date of Sampling:                                                                                                                                      | 19/02/2018                |                          |                      |
|                                                                        |                 | Date of testing:                                                                                                                                       | 19/02/2018                |                          |                      |
| Type of material & Purpose:                                            | BC              | Oven Dry Wt.(gms):                                                                                                                                     | 878.0                     |                          |                      |
| IS Sieve size in mm                                                    | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 19.00                                                                  | 0               | 0                                                                                                                                                      | 0.00                      | 100.00                   | 100.00               |
| 13.20                                                                  | 92              | 92.0                                                                                                                                                   | 10.48                     | 89.52                    | 79 - 100             |
| 9.50                                                                   | 120             | 212.0                                                                                                                                                  | 24.15                     | 75.85                    | 71 - 95              |
| 4.75                                                                   | 132             | 344.0                                                                                                                                                  | 39.18                     | 60.82                    | 53 - 71              |
| 2.360                                                                  | 122             | 466.0                                                                                                                                                  | 53.08                     | 46.92                    | 42 - 58              |
| 1.180                                                                  | 100             | 566.0                                                                                                                                                  | 64.46                     | 35.54                    | 34 - 48              |
| 0.600                                                                  | 72              | 638.0                                                                                                                                                  | 72.67                     | 27.33                    | 26 - 38              |
| 0.300                                                                  | 62              | 700.0                                                                                                                                                  | 79.73                     | 20.27                    | 18 - 28              |
| 0.150                                                                  | 42              | 742.0                                                                                                                                                  | 84.51                     | 15.49                    | 12 - 20              |
| 0.075                                                                  | 82              | 824.0                                                                                                                                                  | 93.85                     | 6.15                     | 4 - 10               |
| Pan                                                                    | 54.0            |                                                                                                                                                        |                           |                          |                      |
| Total                                                                  | 878.0           |                                                                                                                                                        |                           |                          |                      |

Assistant Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.M.P.,  
Bangalore:

Consultant's Representative



| BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX |                 |                                                                                                                                                        |                           |                          |                      |
|------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| Name of Work                                                           | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
| Client                                                                 | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                                             | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                                             | :               | M/S Ram and Company, Engineers & Contractors                                                                                                           |                           |                          |                      |
| Date of Testing                                                        | :               | 19/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                                            | :               | BC                                                                                                                                                     |                           |                          |                      |
| Sample I/D                                                             | :               | BC1                                                                                                                                                    |                           |                          |                      |
| DETERMINATION OF BITUMEN CONTENT                                       |                 |                                                                                                                                                        |                           |                          |                      |
| Description                                                            | Trail 1         | Trail 2                                                                                                                                                |                           |                          |                      |
| 1. Weight of Mixture before extraction, g                              | 910             | 860                                                                                                                                                    |                           |                          |                      |
| 2. Weight of Mixture after extraction, g                               | 859             | 812                                                                                                                                                    |                           |                          |                      |
| 3. Weight of Bitumen                                                   | 51              | 48                                                                                                                                                     |                           |                          |                      |
| 4. Weight of filter paper before extraction, g                         | 2.00            | 2.00                                                                                                                                                   |                           |                          |                      |
| 5. Weight of filter paper after extraction, g                          | 4.00            | 4.00                                                                                                                                                   |                           |                          |                      |
| 6. Weight of fines, g                                                  | 2.00            | 2.00                                                                                                                                                   |                           |                          |                      |
| 7. Weight of Bitumen & fines                                           | 53.00           | 50.00                                                                                                                                                  |                           |                          |                      |
| 8. Bitumen content in %                                                | 5.82            | 5.81                                                                                                                                                   |                           |                          |                      |
| 9. Average Bitumen content in %                                        | 5.82            |                                                                                                                                                        |                           |                          |                      |
| 10. Minimum Bitumen content in %                                       | 5.80            |                                                                                                                                                        |                           |                          |                      |
| GRADATION FOR BC AFTER EXTRACTION<br>(As per MORT&H 500-18, Grading-2) |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                                                       | At site         | Date of Sampling:                                                                                                                                      | 19/02/2018                |                          |                      |
|                                                                        |                 | Date of testing:                                                                                                                                       | 19/02/2018                |                          |                      |
| Type of material & Purpose:                                            | BC              | Oven Dry Wt.(gms):                                                                                                                                     | 859.0                     |                          |                      |
| IS Sieve size in mm                                                    | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 19.00                                                                  | 0               | 0                                                                                                                                                      | 0.00                      | 100.00                   | 100.00               |
| 13.20                                                                  | 80              | 80.0                                                                                                                                                   | 9.31                      | 90.69                    | 79 - 100             |
| 9.50                                                                   | 118             | 198.0                                                                                                                                                  | 23.05                     | 76.95                    | 71 - 95              |
| 4.75                                                                   | 122             | 320.0                                                                                                                                                  | 37.25                     | 62.75                    | 53 - 71              |
| 2.360                                                                  | 110             | 430.0                                                                                                                                                  | 50.06                     | 49.94                    | 42 - 58              |
| 1.180                                                                  | 100             | 530.0                                                                                                                                                  | 61.70                     | 38.30                    | 34 - 48              |
| 0.600                                                                  | 76              | 606.0                                                                                                                                                  | 70.55                     | 29.45                    | 26 - 38              |
| 0.300                                                                  | 70              | 676.0                                                                                                                                                  | 78.70                     | 21.30                    | 18 - 28              |
| 0.150                                                                  | 42              | 718.0                                                                                                                                                  | 83.59                     | 16.41                    | 12 - 20              |
| 0.075                                                                  | 82              | 800.0                                                                                                                                                  | 93.13                     | 6.87                     | 4 - 10               |
| Pan                                                                    | 59.0            |                                                                                                                                                        |                           |                          |                      |
| Total                                                                  | 859.0           |                                                                                                                                                        |                           |                          |                      |

AF 127  
Assistant Engineer  
Kodigehalli  
Yelahanka  
Bangalore.

Engineer  
Division,  
J.B.M.P.,  
Bangalore.

For M/s RAM & COMPANY

M. P. U. N. D  
AF (127)

Consultant's Representative

TEJUS CONSULTANTS

| BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX |                 |                                                                                                                                                        |                           |                          |                      |
|------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|
| Name of Work                                                           | :               | Improvements to Roads and drains at Hoodi Layout , Talacauvery Layout And surrounding Areas in ward No 07 - Byatarayanapura, Kodigehalli Sub Division. |                           |                          |                      |
| Client                                                                 | :               | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                     |                           |                          |                      |
| Consultant                                                             | :               | M/s Tejus Consultants                                                                                                                                  |                           |                          |                      |
| Contractor                                                             | :               | M/S Ram and Company, Engineers & Contractors                                                                                                           |                           |                          |                      |
| Date of Testing                                                        | :               | 19/02/2018                                                                                                                                             |                           |                          |                      |
| Type of Mix                                                            | :               | BC                                                                                                                                                     |                           |                          |                      |
| Sample I/D                                                             | :               | BC1                                                                                                                                                    |                           |                          |                      |
| DETERMINATION OF BITUMEN CONTENT                                       |                 |                                                                                                                                                        |                           |                          |                      |
| Description                                                            | Trail 1         | Trail 2                                                                                                                                                |                           |                          |                      |
| 1. Weight of Mixture before extraction, g                              | 975             | 900                                                                                                                                                    |                           |                          |                      |
| 2. Weight of Mixture after extraction, g                               | 920             | 850                                                                                                                                                    |                           |                          |                      |
| 3. Weight of Bitumen                                                   | 55              | 50                                                                                                                                                     |                           |                          |                      |
| 4. Weight of filter paper before extraction, g                         | 2.00            | 2.00                                                                                                                                                   |                           |                          |                      |
| 5. Weight of filter paper after extraction, g                          | 3.60            | 4.30                                                                                                                                                   |                           |                          |                      |
| 6. Weight of fines, g                                                  | 1.60            | 2.30                                                                                                                                                   |                           |                          |                      |
| 7. Weight of Bitumen & fines                                           | 56.60           | 52.30                                                                                                                                                  |                           |                          |                      |
| 8. Bitumen content in %                                                | 5.81            | 5.81                                                                                                                                                   |                           |                          |                      |
| 9. Average Bitumen content in %                                        | 5.81            |                                                                                                                                                        |                           |                          |                      |
| 10. Minimum Bitumen content in %                                       | 5.80            |                                                                                                                                                        |                           |                          |                      |
| GRADATION FOR BC AFTER EXTRACTION                                      |                 |                                                                                                                                                        |                           |                          |                      |
| (As per MORT&H 500-18, Grading-2)                                      |                 |                                                                                                                                                        |                           |                          |                      |
| Sample Location:                                                       | At site         | Date of Sampling:                                                                                                                                      | 19/02/2018                |                          |                      |
|                                                                        |                 | Date of testing:                                                                                                                                       | 19/02/2018                |                          |                      |
| Type of material & Purpose:                                            | BC              | Oven Dry Wt.(gms):                                                                                                                                     | 920.0                     |                          |                      |
| IS Sieve size in mm                                                    | Weight retained | Cummulative weight retained (gm)                                                                                                                       | Cummulative % of retained | Cummulative % of passing | Specification limits |
| 19.00                                                                  | 0               | 0                                                                                                                                                      | 0.00                      | 100.00                   | 100.00               |
| 13.20                                                                  | 90              | 90.0                                                                                                                                                   | 9.78                      | 90.22                    | 79 - 100             |
| 9.50                                                                   | 110             | 200.0                                                                                                                                                  | 21.74                     | 78.26                    | 71 - 95              |
| 4.75                                                                   | 126             | 326.0                                                                                                                                                  | 35.43                     | 64.57                    | 53 - 71              |
| 2.360                                                                  | 110             | 436.0                                                                                                                                                  | 47.39                     | 52.61                    | 42 - 58              |
| 1.180                                                                  | 96              | 532.0                                                                                                                                                  | 57.83                     | 42.17                    | 34 - 48              |
| 0.600                                                                  | 74              | 606.0                                                                                                                                                  | 65.87                     | 34.13                    | 26 - 38              |
| 0.300                                                                  | 96              | 702.0                                                                                                                                                  | 76.30                     | 23.70                    | 18 - 28              |
| 0.150                                                                  | 92              | 794.0                                                                                                                                                  | 86.30                     | 13.70                    | 12 - 20              |
| 0.075                                                                  | 62              | 856.0                                                                                                                                                  | 93.04                     | 6.96                     | 4 - 10               |
| Pan                                                                    | 64.0            |                                                                                                                                                        |                           |                          |                      |
| Total                                                                  | 920.0           |                                                                                                                                                        |                           |                          |                      |

Assistant Executive Engineer,  
Kodige Talacauvery Layout Division,  
B.B.M.P.,  
Bangalore

M/S RAM AND COMPANY  
Bangalore

M. H. N. D  
AE (W&D)

Consultant's Representative

TEJUS CONSULTANTS

|                 |   |                                                                                                                                                              |
|-----------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Work    | : | Improvements to Roads and drains at Hoodi Layout ,<br>Talacauvery Layout And surrounding Areas in ward No 07 -<br>Byatarayanapura, Kodigehalli Sub Division. |
| Client          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                           |
| Consultant      | : | M/s Tejus Consultants                                                                                                                                        |
| Contractor      | : | M/S Ram and Company, Engineers & Contractors                                                                                                                 |
| Date of Testing | : | 19/02/2018                                                                                                                                                   |
| Type of Mix     | : | Tack coat                                                                                                                                                    |
| Sample I/D      | : | 1                                                                                                                                                            |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| Determination                                               | Unit    | Test No       |            |
|-------------------------------------------------------------|---------|---------------|------------|
|                                                             |         | 1             | 2          |
| Size of Plate (mxm)                                         | Mt      | 0.30 x .30    | 0.30 x .30 |
| Area of Plate (a)                                           | Sq.mtr  | 0.09          | 0.09       |
| Initial Wt of empty Plate (b)                               | Kg      | 0.825         | 0.863      |
| Final weight of plate after<br>application of tack Coat (c) | Kg      | 0.848         | 0.886      |
| Weight of tack Coat (d=c-<br>b)                             | Kg      | 0.023         | 0.023      |
| Rate of spread of tack coat                                 | Kg/sq.m | 0.256         | 0.256      |
| Average                                                     | Kg/sq.m | 0.256         |            |
| Specified Limit                                             | Kg/sq.m | 0.250 Kg/sq.m |            |

4657  
Assistant Engineer,  
Kodigehalli Division,  
Yelahanka B.B.M.P.,  
Bangalore.

For M/s. RAM & COMPANY  
[Signature]

M. P. L. N. D  
AE (154)

  
Consultant's Representative

| Name of Work                                                | :       | Improvements to Roads and drains at Hoodi Layout ,<br>Talacauvery Layout And surrounding Areas in ward No 07 -<br>Byatarayanapura, Kodigehalli Sub Division. |            |
|-------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Client                                                      | :       | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                           |            |
| Consultant                                                  | :       | M/s Tejus Consultants                                                                                                                                        |            |
| Contractor                                                  | :       | M/S Ram and Company, Engineers & Contractors                                                                                                                 |            |
| Date of Testing                                             | :       | 19/02/2018                                                                                                                                                   |            |
| Type of Mix                                                 | :       | Tack coat                                                                                                                                                    |            |
| Sample I/D                                                  | :       | 2                                                                                                                                                            |            |
|                                                             |         |                                                                                                                                                              |            |
| DETERMINATION OF RATE OF SPREAD TACK COAT                   |         |                                                                                                                                                              |            |
| Determination                                               | Unit    | Test No                                                                                                                                                      |            |
|                                                             |         | 1                                                                                                                                                            | 2          |
| Size of Plate (mxm)                                         | Mt      | 0.30 x .30                                                                                                                                                   | 0.30 x .30 |
| Area of Plate (a)                                           | Sq.mtr  | 0.09                                                                                                                                                         | 0.09       |
| Initial Wt of empty Plate (b)                               | Kg      | 0.796                                                                                                                                                        | 0.772      |
| Final weight of plate after<br>application of tack Coat (c) | Kg      | 0.819                                                                                                                                                        | 0.795      |
| Weight of tack Coat (d=c-<br>b)                             | Kg      | 0.023                                                                                                                                                        | 0.023      |
| Rate of spread of tack coat                                 | Kg/sq.m | 0.256                                                                                                                                                        | 0.256      |
| Average                                                     | Kg/sq.m | 0.256                                                                                                                                                        |            |
| Specified Limit                                             | Kg/sq.m | 0.250 Kg/sq.m                                                                                                                                                |            |

4567  
Assl. Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

For M/S RAM & COMPANY  
Partner

M. H. N. D  
AE (H&T)

TEJUS CONSULTANTS  
Consultant's Representative

|                        |   |                                                                                                                                                              |
|------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name of Work</b>    | : | Improvements to Roads and drains at Hoodi Layout ,<br>Talacauvery Layout And surrounding Areas in ward No 07 -<br>Byatarayanapura, Kodigehalli Sub Division. |
| <b>Client</b>          | : | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                           |
| <b>Consultant</b>      | : | M/s Tejus Consultants                                                                                                                                        |
| <b>Contractor</b>      | : | M/S Ram and Company, Engineers & Contractors                                                                                                                 |
| <b>Date of Testing</b> | : | 19/02/2018                                                                                                                                                   |
| <b>Type of Mix</b>     | : | Tack coat                                                                                                                                                    |
| <b>Sample I/D</b>      | : | 1                                                                                                                                                            |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| Determination                                               | Unit    | Test No              |            |
|-------------------------------------------------------------|---------|----------------------|------------|
|                                                             |         | 1                    | 2          |
| Size of Plate (mxm)                                         | Mt      | 0.30 x .30           | 0.30 x .30 |
| Area of Plate (a)                                           | Sq.mtr  | 0.09                 | 0.09       |
| Initial Wt of empty Plate (b)                               | Kg      | 0.820                | 0.860      |
| Final weight of plate after<br>application of tack Coat (c) | Kg      | 0.843                | 0.883      |
| Weight of tack Coat (d=c-<br>b)                             | Kg      | 0.023                | 0.023      |
| Rate of spread of tack coat                                 | Kg/sq.m | 0.256                | 0.256      |
| Average                                                     | Kg/sq.m | 0.256                |            |
| Specified Limit                                             | Kg/sq.m | <b>0.250 Kg/sq.m</b> |            |

*Handwritten:* Af 07  
**Assistant Executive Engineer,  
Kodigehalli Sub Division,  
Yelahanka 2, B.M.P.,  
Bangalore.**

*Handwritten:* M. S. Ram and Company  
**Partner**

*Handwritten:* M. S. Ram and Company  
**Consultant's Representative**

|                                                             |         |                                                                                                                                                              |            |
|-------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Name of Work                                                | :       | Improvements to Roads and drains at Hoodi Layout ,<br>Talacauvery Layout And surrounding Areas in ward No 07 -<br>Byatarayanapura, Kodigehalli Sub Division. |            |
| Client                                                      | :       | BRUHAT BANGALORE MAHANAGARA PALIKE                                                                                                                           |            |
| Consultant                                                  | :       | M/s Tejus Consultants                                                                                                                                        |            |
| Contractor                                                  | :       | M/S Ram and Company, Engineers & Contractors                                                                                                                 |            |
| Date of Testing                                             | :       | 19/02/2018                                                                                                                                                   |            |
| Type of Mix                                                 | :       | Tack coat                                                                                                                                                    |            |
| Sample I/D                                                  | :       | 2                                                                                                                                                            |            |
|                                                             |         |                                                                                                                                                              |            |
| DETERMINATION OF RATE OF SPREAD TACK COAT                   |         |                                                                                                                                                              |            |
| Determination                                               | Unit    | Test No                                                                                                                                                      |            |
|                                                             |         | 1                                                                                                                                                            | 2          |
| Size of Plate (mxm)                                         | Mt      | 0.30 x .30                                                                                                                                                   | 0.30 x .30 |
| Area of Plate (a)                                           | Sq.mtr  | 0.09                                                                                                                                                         | 0.09       |
| Initial Wt of empty Plate (b)                               | Kg      | 0.790                                                                                                                                                        | 0.776      |
| Final weight of plate after<br>application of tack Coat (c) | Kg      | 0.813                                                                                                                                                        | 0.799      |
| Weight of tack Coat (d=c-<br>b)                             | Kg      | 0.023                                                                                                                                                        | 0.023      |
| Rate of spread of tack coat                                 | Kg/sq.m | 0.256                                                                                                                                                        | 0.256      |
| Average                                                     | Kg/sq.m | 0.256                                                                                                                                                        |            |
| Specified Limit                                             | Kg/sq.m | 0.250 Kg/sq.m                                                                                                                                                |            |

46 191  
deep  
Assistant Executive Engineer,  
Kodigehalli Division,  
Yelahanka Zone, B.B.M.P.,  
Bangalore.

M. H. U. N. D  
AE (W. 7)



Consultants Representative